



MONASH University
Information Technology

FIT3126
Applications with C++

Unit Guide

Semester 2, 2011

The information contained in this unit guide is correct at time of publication. The University has the right to change any of the elements contained in this document at any time.

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Table of Contents

<u>FIT3126 Applications with C++ - Semester 2, 2011</u>	1
<u>Mode of Delivery</u>	1
<u>Contact Hours</u>	1
<u>Workload</u>	1
<u>Unit Relationships</u>	1
<u>Prohibitions</u>	1
<u>Prerequisites</u>	1
<u>Chief Examiner</u>	1
<u>Campus Lecturer</u>	1
<u>Caulfield</u>	2
<u>Academic Overview</u>	3
<u>Learning Objectives</u>	3
<u>Graduate Attributes</u>	3
<u>Assessment Summary</u>	4
<u>Teaching Approach</u>	4
<u>Feedback</u>	4
<u>Our feedback to You</u>	4
<u>Your feedback to Us</u>	4
<u>Previous Student Evaluations of this unit</u>	4
<u>Unit Schedule</u>	5
<u>Assessment Requirements</u>	6
<u>Assessment Policy</u>	6
<u>Assessment Tasks</u>	6
<u>Participation</u>	6
<u>Examinations</u>	7
<u>Examination 1</u>	7
<u>Assignment submission</u>	7
<u>Extensions and penalties</u>	7
<u>Returning assignments</u>	8
<u>Other Information</u>	9
<u>Policies</u>	9
<u>Student services</u>	9

FIT3126 Applications with C++ - Semester 2, 2011

The main topics covered in this unit are: Object-oriented design and programming in C++ which include object identification, data encapsulation, inheritance, and polymorphism; concurrent programming techniques which include principles of concurrency, safety and liveness design, multithreaded programming in C++; network and distributed software construction principles and techniques which include network software performance, client-server software construction, socket and RPC programming in C++; and study and compare C++ with Java and Ada in terms of large software constructions.

Mode of Delivery

Caulfield (Day)

Contact Hours

2 hrs lectures/wk, 2 hrs laboratories/wk

Workload

Workload commitments per week are:

- two-hour lecture and
- two-hour tutorial and laboratory (requiring advance preparation)
- a minimum of 2-3 hours of personal study per one hour of contact time in order to satisfy the reading and assignment expectations.

Unit Relationships

Prohibitions

CSE3400, CSE4530, FIT4033

Prerequisites

One of FIT1002, CPE1001 or CSE1202 or equivalent

Chief Examiner

Dr Phu Le

Campus Lecturer

Caulfield

Jay Zeal

Academic Overview

Learning Objectives

At the completion of this unit students will have -

A knowledge and understanding of:

- object-oriented design and programming with C++ for large software development;
- concurrent design and programming with programming languages which do not have built-in features to support concurrency like C++;
- how to develop high performance software with programming languages that do not support concurrency such as C++;
- network and distributed programming using C++.

Developed attitudes that enable them to:

- appreciate OO application design and implementation with C++;
- appreciate design and implementation techniques of concurrent applications with C++;
- appreciate design and implementation techniques of network applications with C++.

Gained practical skills in:

- object identification in software development;
- concurrent design with mutual exclusion, deadlock free software construction, live lock avoidance, and efficient task communications;
- programming with multithreading, semaphores, thread communication and synchronisation mechanism;
- network and distributed programming using OO programming, sockets and C++;
- developing high performance applications with C++ using OO programming together with concurrency and networking.

Graduate Attributes

Monash prepares its graduates to be:

1. responsible and effective global citizens who:

- a. engage in an internationalised world
- b. exhibit cross-cultural competence
- c. demonstrate ethical values

critical and creative scholars who:

- a. produce innovative solutions to problems
- b. apply research skills to a range of challenges
- c. communicate perceptively and effectively

Assessment Summary

Examination (3 hours): 50%; In-semester assessment: 50%

Assessment Task	Value	Due Date
Assignment 1 - Object Oriented Programming and Concurrency	20%	Week 7
Assignment 2 - Object Oriented Programming and Network Programming	20%	Week 12
Lab work	10%	Weekly
Examination 1	50%	To be advised

Teaching Approach

Lecture and tutorials or problem classes

This teaching and learning approach provides facilitated learning, practical exploration and peer learning.

Feedback

Our feedback to You

Types of feedback you can expect to receive in this unit are:

- Informal feedback on progress in labs/tutes
- Graded assignments with comments

Your feedback to Us

Monash is committed to excellence in education and regularly seeks feedback from students, employers and staff. One of the key formal ways students have to provide feedback is through SETU, Student Evaluation of Teacher and Unit. The University's student evaluation policy requires that every unit is evaluated each year. Students are strongly encouraged to complete the surveys. The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

For more information on Monash's educational strategy, and on student evaluations, see:

<http://www.monash.edu.au/about/monash-directions/directions.html>

<http://www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html>

Previous Student Evaluations of this unit

If you wish to view how previous students rated this unit, please go to

<https://emuapps.monash.edu.au/unitevaluations/index.jsp>

Unit Schedule

Week	Activities	Assessment
0		No formal assessment or activities are undertaken in week 0
1	Introduction and programming language evolution	
2	C++ basics 1 - Objects and Classes	
3	C++ basics 2 - Inheritance	
4	C++ basics 3 - Polymorphism	
5	Introduction to concurrency	
6	Thread based programming 1	
7	Thread based programming 2	Assignment 1 due Week 7
8	Advanced concepts in multithreading	
9	Introduction to network programming	
10	Network programming with concurrency	
11	Network programming in depth	
12	Case study	Assignment 2 due Week 12
	SWOT VAC	No formal assessment is undertaken SWOT VAC
	Examination period	LINK to Assessment Policy: http://policy.monash.edu.au/policy-bank/academic/education/assessment/assessment-in-coursework-policy.html

*Unit Schedule details will be maintained and communicated to you via your MUSO (Blackboard or Moodle) learning system.

Assessment Requirements

Assessment Policy

To pass a unit which includes an examination as part of the assessment a student must obtain:

- 40% or more in the unit's examination, and
- 40% or more in the unit's total non-examination assessment, and
- an overall unit mark of 50% or more.

If a student does not achieve 40% or more in the unit examination or the unit non-examination total assessment, and the total mark for the unit is greater than 50% then a mark of no greater than 49-N will be recorded for the unit

Assessment Tasks

Participation

• Assessment task 1

Title:

Assignment 1 - Object Oriented Programming and Concurrency

Description:

Completion of the assignment requires a good knowledge of OOP concepts and concurrency principles.

Implemented program needs to employ multiple threads created using C++.

Weighting:

20%

Criteria for assessment:

- Implementation of specified features
- Quality of solution: efficiency, documentation, accuracy, adherence to OO principles
- Evidence of testing
- Quality of oral presentation

Due date:

Week 7

• Assessment task 2

Title:

Assignment 2 - Object Oriented Programming and Network Programming

Description:

Completion of the assignment involves:

- Network programming with Unix Sockets or Boost library
- OOP and concurrency principles

Weighting:

20%

Assessment Requirements

Criteria for assessment:

- Implementation of specified features
- Quality of solution: efficiency, documentation, accuracy, adherence to OO principles
- Evidence of testing
- Quality of oral presentation

Due date:

Week 12

• **Assessment task 3**

Title:

Lab work

Description:

Weekly lab tasks to be completed during 2 hour lab session.

Weighting:

10%

Criteria for assessment:

- Completion of tasks during lab session

Due date:

Weekly

Examinations

• **Examination 1**

Weighting:

50%

Length:

3 hours

Type (open/closed book):

Closed book

Electronic devices allowed in the exam:

None

Assignment submission

It is a University requirement

(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-procedures.html>) for students to submit an assignment coversheet for each assessment item. Faculty Assignment coversheets can be found at <http://www.infotech.monash.edu.au/resources/student/forms/>. Please check with your Lecturer on the submission method for your assignment coversheet (e.g. attach a file to the online assignment submission, hand-in a hard copy, or use an online quiz).

Extensions and penalties

Submission must be made by the due date otherwise penalties will be enforced.

You must negotiate any extensions formally with your campus unit leader via the in-semester special consideration process:

Assessment Requirements

<http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html>.

Returning assignments

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later

Other Information

Policies

Monash has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards, and to provide advice on how they might uphold them. You can find Monash's Education Policies at:

<http://policy.monash.edu.au/policy-bank/academic/education/index.html>

Key educational policies include:

- Plagiarism
(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-policy.html>)
- Assessment
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/assessment-in-coursework-p>)
- Special Consideration
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.h>)
- Grading Scale
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/grading-scale-policy.html>)
- Discipline: Student Policy
(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-discipline-policy.html>)
- Academic Calendar and Semesters (<http://www.monash.edu.au/students/key-dates/>);
- Orientation and Transition (<http://www.infotech.monash.edu.au/resources/student/orientation/>);
and
- Academic and Administrative Complaints and Grievances Policy
(<http://www.policy.monash.edu/policy-bank/academic/education/management/complaints-grievance-policy>)
- Codes of Practice for Teaching and Learning
(<http://www.policy.monash.edu.au/policy-bank/academic/education/conduct/suppdocs/code-of-practice-tea>)

Student services

The University provides many different kinds of support services for you. Contact your tutor if you need advice and see the range of services available at www.monash.edu.au/students. The Monash University Library provides a range of services and resources that enable you to save time and be more effective in your learning and research. Go to <http://www.lib.monash.edu.au> or the library tab in my.monash portal for more information. Students who have a disability or medical condition are welcome to contact the Disability Liaison Unit to discuss academic support services. Disability Liaison Officers (DLOs) visit all Victorian campuses on a regular basis

- Website: <http://adm.monash.edu/sss/equity-diversity/disability-liaison/index.html>;
- Telephone: 03 9905 5704 to book an appointment with a DLO;
- Email: dlu@monash.edu
- Drop In: Equity and Diversity Centre, Level 1 Gallery Building (Building 55), Monash University, Clayton Campus.